Nevada Division of Environmental Protection

ANALYSIS OF EXCEPTIONAL EVENTS CONTRIBUTING TO HIGH PM10 CONCENTRATIONS IN THE PAHRUMP VALLEY

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ANALYSIS OF EXCEPTIONAL EVENTS CONTRIBUTING TO HIGH PM_{10} CONCENTRATIONS IN THE PAHRUMP VALLEY ON MARCH 29TH AND APRIL 3RD 2009

1 INTRODUCTION

1.1 Purpose

This document substantiates the request by the Nevada Division of Environmental Protection (NDEP) to flag exceedances of the 150 $\mu g/m^3$ PM_{10} 24-hour National Ambient Air Quality Standard (NAAQS)[1] in the Pahrump Valley as exceptional events under the U.S. Environmental Protections Agency (U.S. EPA) regulation for *The Treatment of Data Influenced by Exceptional Events*, known as the Exceptional Events Rule (40 CFR, Sections 50.1 & 51.14). Natural events caused exceedances of the federal standard at one Federal Equivalent Method (FEM) Beta Attenuation Monitor (BAM) on March 29th and April 3rd 2009, with a midnight-to-midnight 24 hour average concentration of 283 $\mu g/m^3$ and 189 $\mu g/m^3$, respectively, at the Manse School air monitoring station in Nye County (AQS Site Code 32-023-0014).

The elevated particulate matter concentrations observed on March 29th and April 3rd, 2009 occurred as a result of entrainment of fugitive windblown dust from very high winds that impacted much of the Pahrump Valley. The NDEP has submitted the hourly PM_{10} data from the Manse School monitor on those days to the U.S. EPA AQS database and has placed the appropriate AQS flags throughout the days to indicate that the data was affected by exceptional events due to high winds. This flagging indicates that the ambient air quality data was influenced by the windblown dust related emissions and insures that the data is properly represented in the regulatory process.

1.2 Organization of the Document

This document is designed to provide summary information to the public as well as the specific detailed analysis to meet the requirements of the Exceptional Events Rule. Section 1, Introduction, describes the purpose, exceptional event criteria, background of the Exceptional Event Rule and background information related to high wind events in the Pahrump Valley, including:

[1] NAAQS are pollutant-specific thresholds set by the federal government at levels to protect human health. The NAAQS for PM_{10} is 150 micrograms per cubic meter ($\mu g/m^3$) for 24 hours.

- The geographic setting;
- The regulatory measures, showing that continuing reasonable controls are in effect in the Valley and that ongoing public education programs and event forecasting and notification plans are in place;
- An overview of the two high PM_{10} events in the Valley, including a historical perspective of PM_{10} exceptional events.

Section 2 describes the analysis of the high wind exceptional events that caused the PM_{10} NAAQS exceedances on March 29th and April 3rd, 2009. The Description of Exceedance, Section 2.1, presents the PM_{10} measurements related to the NAAQS exceedance. Section 2.2, the Conceptual Model, describes how each event unfolded to cause the NAAQS exceedances. Section 2.3, Technical Criteria for High Wind Dust Exceptional Event Demonstration, details how the natural event/episode satisfies the criteria of the Exceptional Events Rule, that is,

- The event is not reasonably controllable or preventable;
- There is a clear causal connection between the PM measurement and the high wind event;
- There is evidence that the event is associated with a PM_{10} concentration in excess of normal historical fluctuations, including background;
- The event affects air quality;
- The event was caused by human activity unlikely to recur at a particular location, or that it was a natural event; and
- The exceedance or violation would not have occurred “but for” the causal event (i.e., due to the high wind events in these cases).

Section 3 contains Procedural Requirements, including the flagging of data and the public notification process and a checklist of the exceptional event demonstration requirements.

Supporting material for the March 29th and the April 3rd, 2009 PM_{10} analysis beyond what is included in Section 2 are provided in a separate Appendices.

1.3 Exceptional Events Rule and Background

Since 1977, U.S. EPA has implemented policies to address the treatment of ambient air quality monitoring data that has been affected by exceptional or natural events. In July 1986, U.S. EPA issued a document entitled *Guideline on the Identification and Use of Air Quality Data Affected by Exceptional Events*, introducing a flagging system to identify air quality measurements influenced by exceptional events that, if left unidentified, could lead to possible misinterpretation or misuse of the data. In 1996, U.S. EPA developed a guidance document entitled *Areas Affected by PM-10 Natural Events*, which provided criteria and procedures for States to request special treatment (i.e., flagging for exclusion from standard compliance consideration) for data affected by natural events (e.g., wildfire, high wind events, and volcanic and seismic activities). On March 14, 2007, U.S. EPA promulgated a formal rule, entitled: *The Treatment of Data Influenced by Exceptional Events.* Exceptional events are events caused by human activity that are unlikely to recur at a particular location or caused by natural events, which may recur, sometimes frequently. These exceptional events must affect air quality and are not reasonably controllable or preventable using techniques that tribal, state or local air agencies may implement in order to attain and maintain the NAAQS. After an event is determined by U.S. EPA to be an exceptional event through the process established in the regulation, it is flagged as such in the U.S. EPA Air Quality System (AQS) database. The flagged data remains available to the public but are not counted toward attainment status. The U.S. EPA rulemaking:

- Ensures that air quality measurements are properly evaluated and characterized with regard to their causes;
- Identifies reasonable actions that should be taken to address the air quality and public health impacts caused by these types of events;
- Intends to avoid imposing unreasonable planning requirements on state, local and tribal air quality agencies related to exceedances of the NAAQS due to exceptional events;
- Ensures that the use of air quality data, whether afforded special treatment or not, is subject to full public disclosure and review.

Demonstration packages to address high wind dust exceptional events are required to address the following technical criteria:

- The event affected air quality;
- The event was not reasonably controllable or preventable;
- The event is unlikely to reoccur at a particular location or was a natural event;
- There was a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area;
- Evidence that the event is associated with a measured concentration in excess of normal historical fluctuations, including background; and
- There would have been no exceedance or violation but for the event.

The Exceptional Events Rule does not require States to submit formal mitigation plans; however, States must provide public notice, public education, and provide for implementation of reasonable measures to protect public health when an event occurs. In the preamble of the Exceptional Event Rule, U.S. EPA specifically includes *High Wind Events* in the list of examples of exceptional events, classified as *Natural Events*. The Rule defines Natural Events as follows:

> *It is important to note that natural events, which are one form of exceptional events according to this definition, may recur, sometimes*

frequently (e.g., western wildfires). For the purposes of this rule, EPA is defining ''natural event'' as an event in which human activity plays little or no direct causal role to the event in question. We recognize that over time, certain human activities may have had some impact on the conditions which later give rise to a ''natural'' air pollution event. However, we do not believe that small historical human contributions should preclude an event from being deemed ''natural.''

1.4 Geographic Setting

The Pahrump Valley is located in the Northern Mohave Desert about 50 miles northwest of Las Vegas. As shown in Figure 1-1, The Pahrump Valley (hydrographic area 162) is bounded to the east and north by the Spring Mountains and to the northwest by the Last Chance Range. Due to the rain shadow effect of the Sierra Nevada, moisture associated with Pacific Storms rarely reaches the Valley. The Pahrump Valley experiences an arid climate (~5 inches of precipitation per year) typical of the northern Mohave Desert region. The average daily maximum temperature in July is approximately 100^0 Fahrenheit (F) and approximately 57^0F in January. Average daily minimum temperatures vary from 57^0F in July to 26^0F in January.

The typical seasonal and diurnal variation of PM_{10} concentration in the Pahrump Valley displays a distinct pattern. Most of the major wind events (winds greater than 20-25 miles per hour) occur in the spring and fall. PM_{10} concentrations approaching or exceeding the NAAQS generally occur during these high wind events. Wind events in excess of 20-25 miles per hour (mph) generate periods of gusting wind, creating blowing sand and dust. Fugitive dust[2] during such high wind events is largely responsible for exceedances of the 24-hour PM_{10} air quality standard. The main dust sources include entrained paved road dust, entrained dust from unpaved roads, construction activities, and disturbed vacant land. Given the dry desert climate and sparse vegetation, low levels of natural background emissions of fugitive dust have always been present in the Pahrump Valley, with higher levels occurring during fire and wind events.

Figure 1-2 shows the PM_{10} Beta Attenuation Monitors (BAM) in the Pahrump Valley.

[2] Fugitive dust is particulate matter suspended in the air either by mechanical disturbance of surface material or by wind action blowing across surface areas.

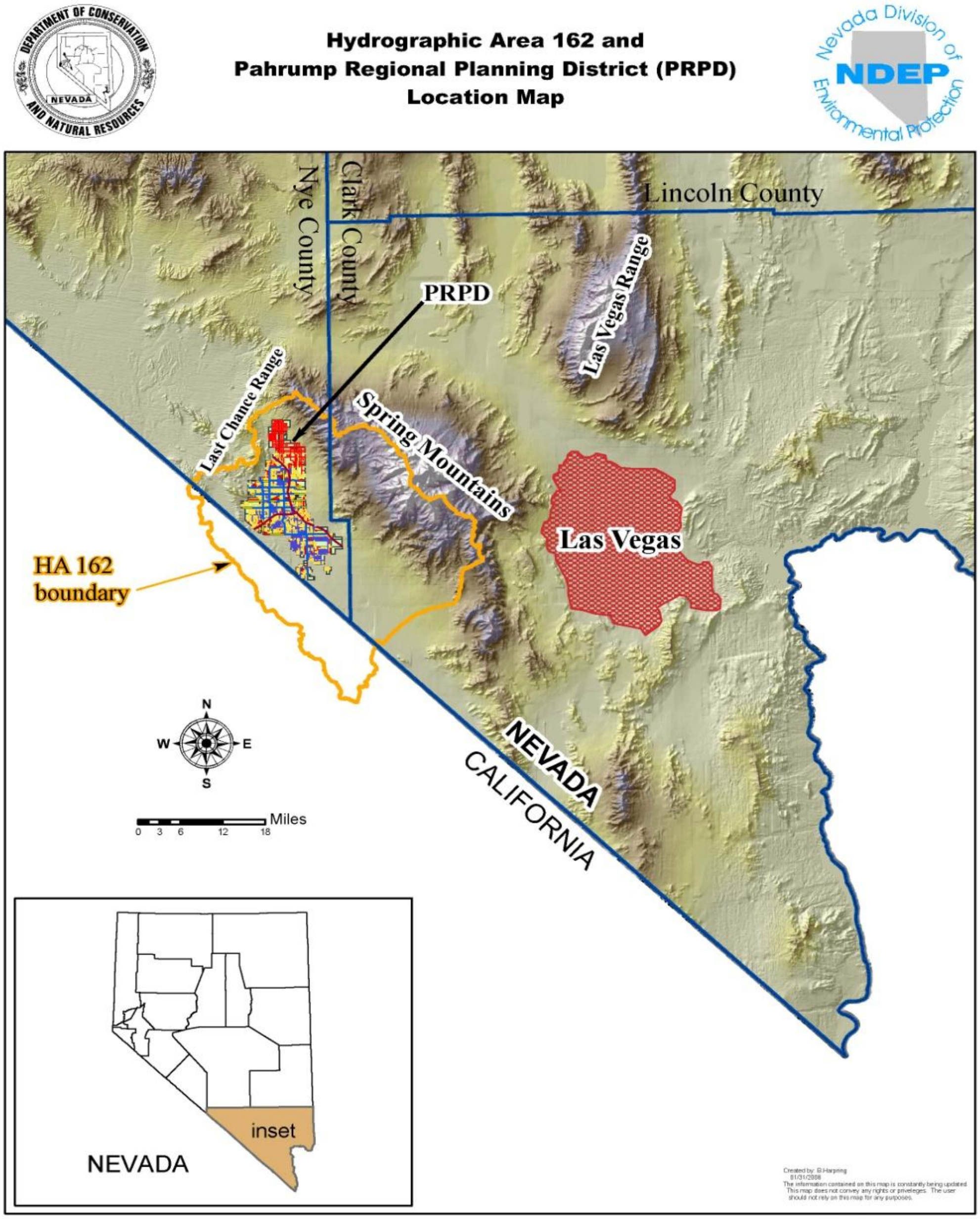

FIGURE 1-1
Hydrographic Area 162

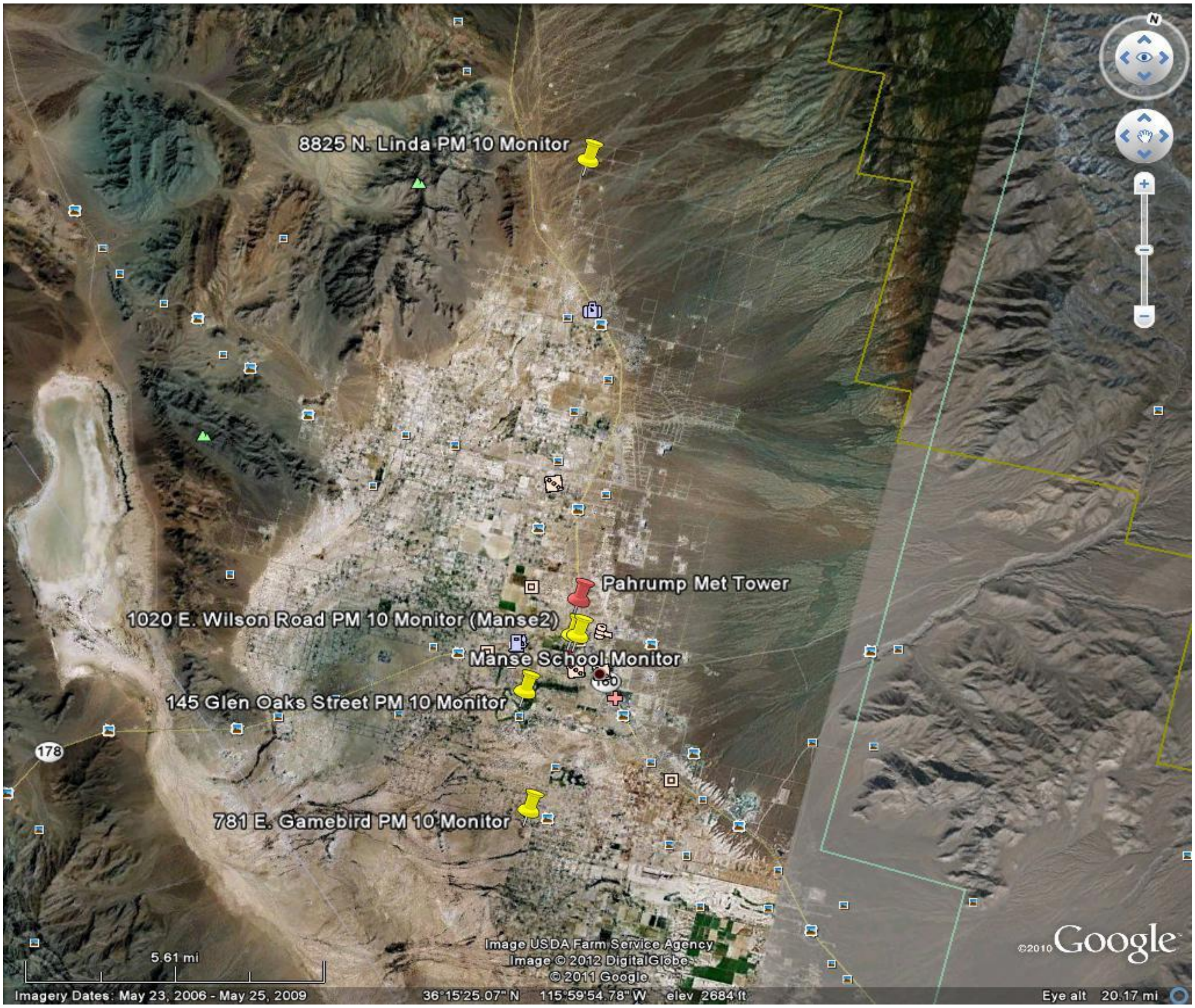

FIGURE 1-2
Map of Pahrump Valley PM_{10} Monitors

1.5 Regulatory Measures

The sources causing the PM_{10} exceedances vary between both natural and anthropogenic. However, control strategies and best management practices have been developed to ensure the Pahrump Valley meets the federal PM_{10} standard. The main strategy for the Town of Pahrump was to develop a Pahrump Regional Planning District Master Plan (Appendix A), which provides goals, objectives and policies to guide land use planning, recommendations for amending the existing zoning code, and an ordinance developing dust control regulations. The Master Plan establishes the framework for an Air Quality Plan, an Adequate Public Facilities Ordinance, Zoning Ordinance, Streets and Highways Plan, and Staffing and Implementation Plan. One of the most important aspects of planning and long-range decision-making is land use. The Town of Pahrump has developed a land use plan which intends to guide the District's overall growth in a manner that will help maximize resources and plan for orderly growth and development. This land use plan helps to develop mechanisms in the zoning ordinance to protect public health, safety and welfare. Also, within the Master Plan, Pahrump officials have developed an Air Quality Element, which outlines a series of policies and implementation actions that can be taken to reduce PM_{10} emissions in the Pahrump Valley. Additionally, the NDEP has adopted Nevada Administrative Code (NAC) 445B.22037 which regulates fugitive dust and surface disturbances.

Based on the Master Plan, the Town of Pahrump passed an Ordinance (Appendix B) regulating, controlling and prohibiting excessive emission of air pollution. Also, they developed a Dust Management Handbook (Appendix C), which includes general information, best management practices, and enforcement procedures regarding dust control. This handbook is designed to help land use applicants develop a dust control plan for projects that disturb an aggregate of 0.5 acres or greater.

Individual land owners are participating to help control fugitive dust emissions from their property. For example, the Pahrump Dairy, which has had dust control problems in the past, has developed a control program for fugitive dust (Appendix D). These strategies serve as an acknowledgment by the Dairy of their duty to address federal, state and local laws governing fugitive dust emissions.

1.6 Historical Perspective of PM_{10} in the Pahrump Valley

Table 1-1 summarizes the days with high PM10 concentrations in the Pahrump Valley, defined as days exceeding 150 $\mu g/m^3$, between 2004 and 2010. All of the 24-hour PM_{10} NAAQS exceedances that occurred have been flagged as requesting exclusion under the U.S. EPA Exceptional Events Policy. Since 2004, no 24-hour NAAQS exceedances occurred in the Pahrump Valley that were not associated with strong winds. Throughout the 7-year period, 24 days exceeded the 150 $\mu g/m^3$ NAAQS concentration at air monitoring stations in the Valley, for an overall average of 3.4 exceedances per year valley-wide. All of the NAAQS exceedances in the Valley were associated with high wind natural events.

TABLE 1-1
Historical Summary of Pahrump Valley FEM BAM PM_{10} 24-Hour High Concentrations Exceeding 150 μg/m^3 between January 2004 and December 2010 with Primary Causal Event

Event Date	Station	FEM PM_{10} (μg/m^3)	Cause
April 22, 2004	Pool	**225**	High Winds
April 28, 2004	Pool	**266**	High Winds
April 28, 2004	Willow Creek	**178**	High Winds
September 22, 2006	Manse School	**218**	High Winds
November 29, 2006	Manse School	**271**	High Winds
November 29, 2006	Catholic Church	**169**	High Winds
November 29, 2006	Willow Creek	**212**	High Winds
December 28, 2006	Manse School	**559**	High Winds
January 5, 2007	Manse School	**354**	High Winds
January 5, 2007	Willow Creek	**174**	High Winds
March 27, 2007	Manse School	**171**	High Winds
May 2, 2007	Manse School	**172**	High Winds
June 5, 2007	Manse School	**326**	High Winds
June 5, 2007	Willow Creek	**232**	High Winds
November 23, 2007	Manse School	**166**	High Winds
November 23, 2007	Linda Street	**171**	High Winds
February 13, 2008	Manse School	**223**	High Winds
May 21, 2008	Manse School	**217**	High Winds
June 4, 2008	Manse School	**224**	High Winds
March 29, 2009	Manse School	**283**	High Winds
April 3, 2009	Manse School	**189**	High Winds
September 30, 2009	Manse School	**208**	High Winds
October 27, 2009	Manse School	**250**	High Winds
October 28, 2009	Manse School	**164**	High Winds

2 HIGH WIND EXCEPTIONAL EVENT ANALYSIS

2.1 Description of Exceedances: March 29th and April 3rd, 2009

Exceedances of the PM_{10} NAAQS were recorded at the Town of Pahrump Manse School monitoring station on March 29th and April 3rd, 2009 due to high winds. The BAM PM_{10} FEM sampler measured high concentrations for several consecutive hours in the morning and afternoon, causing an exceptionally high 24-hour average concentration for the day (midnight to midnight): 283 µg/m3 on March 29th and 189 µg/m3 on April 3rd. While no other PM_{10} measurements exceeded the federal standard (150 µg/m3), other stations in the Pahrump Valley had elevated concentrations during the same period. Tables 2-1 and 2-2 summarize the hourly and 24-hour average PM_{10} concentrations at Manse School from March 28th through the 30th and April 2nd through the 4th.

Figures 2-1 and 2-2 show this data graphically for all FEM stations in the Pahrump Valley from 0000 PST through 2300 PST for each day. As compared to the previous day (March 28th) the hourly PM_{10} concentration at the Manse School on March 29th was elevated from the late afternoon and first reached over 150 $\mu g/m^3$ for the 1700 PST hour. The concentrations remained over 150 $\mu g/m^3$ through the 2300 hour but began to decrease beginning in the morning on March 30th. On April 3rd, as compared to the previous day (April 2nd) the hourly PM_{10} concentration at the Manse School monitor was elevated from the early morning and first reached over 150 $\mu g/m^3$ for the 0900 PST hour. The concentrations remained over 150 $\mu g/m^3$ through the 1800 hour, with a peak of 765 $\mu g/m^3$ during the 1100 PST hour.

On March 29th and April 3rd, the Church and Linda monitoring stations BAM PM_{10} values peaked during the same time period, but they only exceeded the 150 $\mu g/m^3$ for a few hours, consequently there were no 24-hour NAAQS exceedances.

TABLE 2-1
Hourly BAM Measurements at the Pahrump Valley Air Monitoring Stations
Between 0000 PST on March 28th through 1200 PST March 30th, 2009

		Manse School Monitor		Church Monitor		Linda Monitor		Willow Creek Monitor	
Date	**Hour (PST)**	**BAM Hourly PM_{10} (μg/m^3)**	**24-Hour PM_{10} (μg/m^3) (midnight to midnight)**	**BAM Hourly PM_{10} (μg/m^3**	**24-Hour PM_{10} (μg/m^3) (midnight to midnight)**	**BAM Hourly PM_{10} (μg/m^3**	**24-Hour PM_{10} (μg/m^3) (midnight to midnight)**	**BAM Hourly PM_{10} (μg/m^3**	**24-Hour PM_{10} (μg/m^3) (midnight to midnight)**
03/28/09	0000	7.59	11.5	3.38	4.1	20.0	22.0	N/A	N/A
	0100	8.00		3.08		21.0		N/A	
	0200	4.94		11.44		20.0		N/A	
	0300	6.97		6.07		22.0		N/A	
	0400	10.04		3.07		22.0		N/A	
	0500	9.36		4.94		18.0		N/A	
	0600	11.65		14.12		19.0		N/A	
	0700	30.45		0		21.0		N/A	
	0800	9.80		0.03		22.0		N/A	
	0900	7.88		0.98		23.0		N/A	
	1000	4.63		16.78		23.0		N/A	
	1100	3.92		1.70		21.0		N/A	
	1200	1.12		0.70		21.0		N/A	
	1300	2.57		0.0		21.0		N/A	
	1400	7.66		0.0		22.0		N/A	
	1500	3.25		1.79		23.0		N/A	
	1600	6.22		0.70		21.0		N/A	
	1700	12.40		0.0		18.0		N/A	
	1800	52.47		12.74		21.0		N/A	
	1900	6.64		0.0		28.0		N/A	
	2000	13.95		0.0		27.0		N/A	
	2100	15.13		5.4		26.0		N/A	
	2200	22.16		7.41		25.0		N/A	
	2300	17.92		3.38		24.0		N/A	
03/29/09	0000	17.51	**283.4**	1.57	**82.2**	25.0	**74.2**	N/A	**N/A**
	0100	28.13		2.04		24.0		N/A	
	0200	9.99		11.43		23.0		N/A	
	0300	9.86		13.45		20.0		N/A	
	0400	8.28		5.40		20.0		N/A	
	0500	16.12		7.41		25.0		N/A	
	0600	17.17		12.78		30.0		N/A	
	0700	24.63		15.77		26.0		N/A	
	0800	20.9		11.43		35.0		N/A	

TABLE 2-1 (continued)
Hourly BAM Measurements at the Pahrump Valley Air Monitoring Stations
Between 0000 PST on March 28th through 1200 PST March 30th, 2009

		Manse School Monitor		**Church Monitor**		**Linda Monitor**		**Glen Oaks Monitor**	
Date	**Hour (PST)**	**BAM Hourly PM_{10} (µg/m^3)**	**24-Hour PM_{10} (µg/m^3) (midnight to midnight)**	**BAM Hourly PM_{10} (µg/m^3)**	**24-Hour PM_{10} (µg/m^3) (midnight to midnight)**	**BAM Hourly PM_{10} (µg/m^3)**	**24-Hour PM_{10} (µg/m^3) (midnight to midnight)**	**BAM Hourly PM_{10} (µg/m^3)**	**24-Hour PM_{10} (µg/m^3) (midnight to midnight)**
	0900	40.92		30.19		32.0		N/A	
	1000	36.33		12.66		34.0		N/A	
	1100	27.05		10.74		34.0		N/A	
	1200	18.18		9.41		31.0		N/A	
	1300	21.24		9.97		30.0		N/A	
	1400	15.48		15.44		29.0		N/A	
	1500	28.35		32.19		35.0		N/A	
	1600	**131.50**		63.69		**124.0**		N/A	
	1700	**994**		**426.20**		**419.0**		N/A	
	1800	**994**		**389.50**		**190.0**		N/A	
	1900	**995**		**383.50**		**205.0**		N/A	
	2000	**994**		**293.40**		**123.0**		N/A	
	2100	**994**		**114.10**		**164.0**		N/A	
	2200	**994**		83.40		64.0		N/A	
	2300	**365.10**		16.66		39.0		N/A	
03/30/09	0000	42.30	30.4	14.15	7.2	39.0	26.3	N/A	N/A
	0100	106.80		31.94		27.0		N/A	
	0200	92.70		15.79		36.0		N/A	
	0300	61.24		6.07		30.0		N/A	
	0400	18.90		6.63		31.0		N/A	
	0500	17.96		6.80		29.0		N/A	
	0600	24.63		6.74		35.0		N/A	
	0700	13.09		7.41		33.0		N/A	
	0800	19.53		6.07		26.0		N/A	
	0900	41.04		6.07		27.0		N/A	
	1000	41.60		6.74		28.0		N/A	
	1100	42.96		5.45		26.0		N/A	
	1200	13.13		3.38		23.0		N/A	

TABLE 2-2
Hourly BAM Measurements at the Pahrump Valley Air Monitoring Stations
Between 0000 PST on April 2nd through 1200 PST April 4th, 2009

		Manse School Monitor		Church Monitor		Linda Monitor		Glen Oaks Monitor	
Date	**Hour (PST)**	**BAM Hourly PM_{10} (µg/m^3)**	**24-Hour PM_{10} (µg/m^3) (midnight to midnight)**	**BAM Hourly PM_{10} (µg/m^3)**	**24-Hour PM_{10} (µg/m^3) (midnight to midnight)**	**BAM Hourly PM_{10} (µg/m^3)**	**24-Hour PM_{10} (µg/m^3) (midnight to midnight)**	**BAM Hourly PM_{10} (µg/m^3)**	**24-Hour PM_{10} (µg/m^3) (midnight to midnight)**
04/02/09	0000	2.70	46.6	0.00	16.2	20.9	35.1	N/A	N/A
	0100	1.21		2.04		18.7		N/A	
	0200	5.60		6.74		21.6		N/A	
	0300	6.97		7.41		23.6		N/A	
	0400	9.69		5.02		21.1		N/A	
	0500	21.06		14.11		18.2		N/A	
	0600	161.40		20.10		19.7		N/A	
	0700	18.68		6.74		21.1		N/A	
	0800	3.20		2.71		22.1		N/A	
	0900	61.28		3.38		32.1		N/A	
	1000	89.50		26.16		35.1		N/A	
	1100	89.80		9.41		41.0		N/A	
	1200	63.96		12.76		42.2		N/A	
	1300	38.17		4.42		30.6		N/A	
	1400	25.30		12.76		27.3		N/A	
	1500	47.01		17.45		33.1		N/A	
	1600	87.20		44.92		46.3		N/A	
	1700	67.42		24.15		71.5		N/A	
	1800	41.94		24.83		48.8		N/A	
	1900	75.90		31.70		51.9		N/A	
	2000	41.94		34.52		44.4		N/A	
	2100	45.36		20.15		51.2		N/A	
	2200	49.37		20.82		50.0		N/A	
	2300	62.64		35.58		50.2		N/A	
04/03/09	0000	29.52	**189.0**	20.83	**32.6**	47.6	**49.2**	N/A	**N/A**
	0100	27.96		24.66		40.5		N/A	
	0200	21.23		22.01		39.5		N/A	
	0300	32.09		24.84		39.7		N/A	
	0400	32.77		21.97		39.2		N/A	
	0500	32.77		21.98		63.4		N/A	
	0600	41.37		34.24		53.8		N/A	
	0700	52.47		36.92		48.3		N/A	
	0800	31.44		6.07		48.5		N/A	

TABLE 2-2 (continued)
Hourly BAM Measurements at the Pahrump Valley Air Monitoring Stations
Between 0000 PST on April 2nd through 1200 PST April 4th, 2009

		Manse School Monitor		**Church Monitor**		**Linda Monitor**		**Glen Oaks Monitor**	
Date	**Hour (PST)**	**BAM Hourly PM_{10} ($\mu g/m^3$)**	**24-Hour PM_{10} ($\mu g/m^3$) (midnight to midnight)**	**BAM Hourly PM_{10} ($\mu g/m^3$)**	**24-Hour PM_{10} ($\mu g/m^3$) (midnight to midnight)**	**BAM Hourly PM_{10} ($\mu g/m^3$)**	**24-Hour PM_{10} ($\mu g/m^3$) (midnight to midnight)**	**BAM Hourly PM_{10} ($\mu g/m^3$)**	**24-Hour PM_{10} ($\mu g/m^3$) (midnight to midnight)**
	0900	**577.30**		**49.65**		51.2		N/A	
	1000	**483.30**		**26.85**		46.3		N/A	
	1100	**765.0**		**44.30**		35.8		N/A	
	1200	**45.67**		**7.66**		21.9		N/A	
	1300	**572.70**		**25.57**		35.8		N/A	
	1400	**455.80**		**69.57**		**107.1**		N/A	
	1500	**369.90**		**82.40**		**116.8**		N/A	
	1600	**509.0**		**76.10**		**69.8**		N/A	
	1700	**151.40**		**51.66**		48.3		N/A	
	1800	**142.40**		**35.62**		46.6		N/A	
	1900	47.03		19.48		48.0		N/A	
	2000	36.17		18.81		30.4		N/A	
	2100	25.70		18.81		33.4		N/A	
	2200	31.76		18.81		35.1		N/A	
	2300	20.10		12.77		33.8		N/A	
04/04/09	0000	19.19	14.1	11.43	8.1	31.9	23.2	N/A	N/A
	0100	24.96		16.13		30.9		N/A	
	0200	16.47		16.82		27.5		N/A	
	0300	20.90		15.45		26.0		N/A	
	0400	21.90		22.83		27.2		N/A	
	0500	19.19		21.49		28.7		N/A	
	0600	14.78		13.11		28.0		N/A	
	0700	30.65		16.13		31.4		N/A	
	0800	32.43		8.08		26.3		N/A	
	0900	12.40		6.07		25.5		N/A	
	1000	4.93		2.71		23.3		N/A	
	1100	0.0		2.11		22.1		N/A	
	1200	0.45		2.71		23.1		N/A	

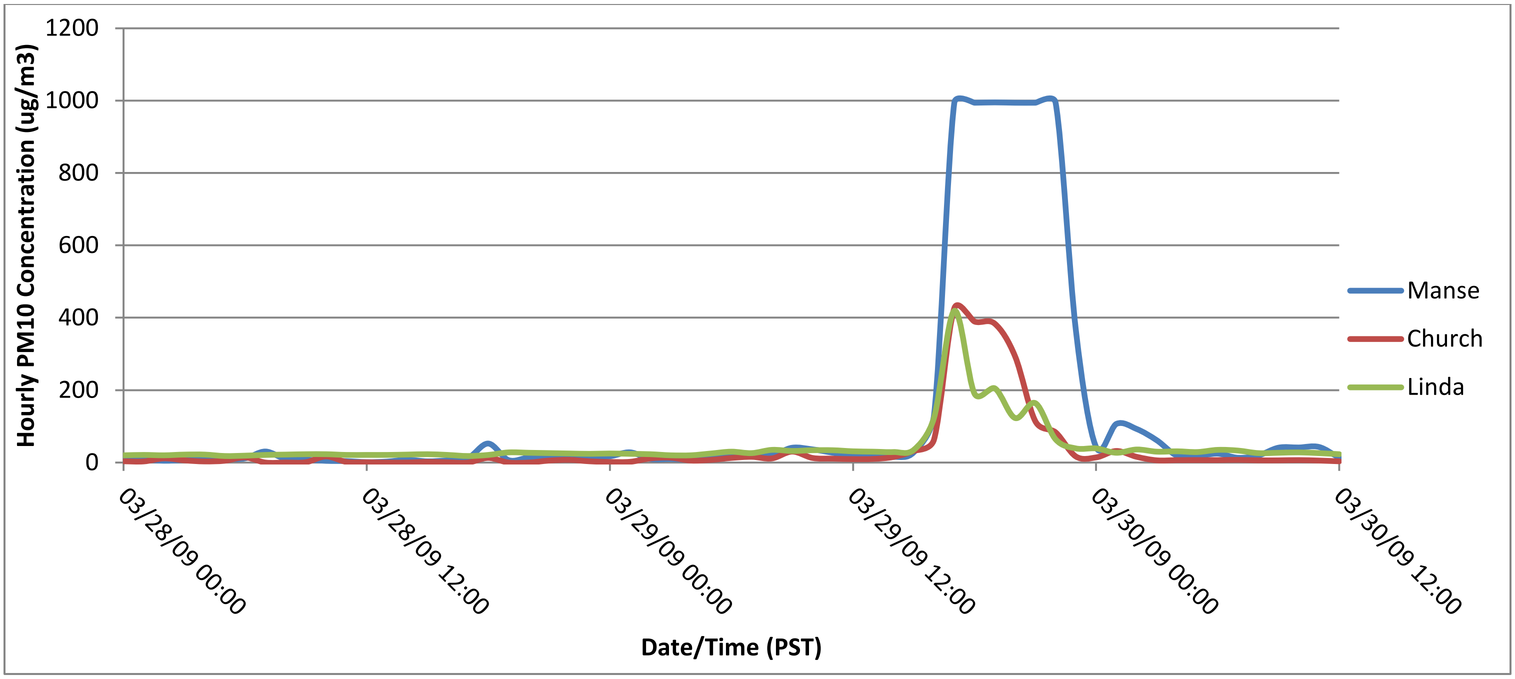

FIGURE 2-1

Time Series of Pahrump Valley Hourly BAM FEM PM_{10} ($\mu g/m^3$) from 0000 PST March 28th through 1200 PST March 30th, 2009

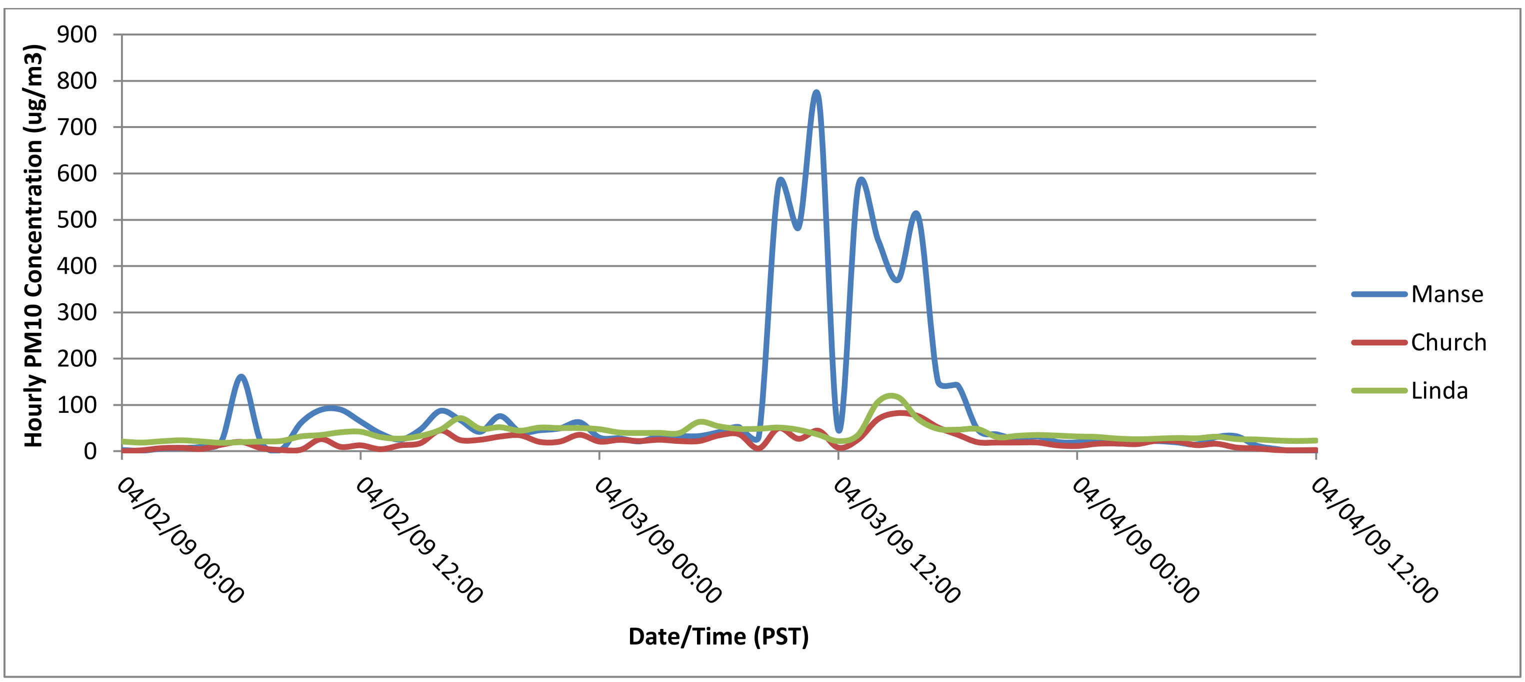

FIGURE 2-2

Time Series of Pahrump Valley Hourly BAM FEM PM_{10} ($\mu g/m^3$) from 0000 PST April 2nd through 1200 PST April 4th, 2009

2.2 Conceptual Model: How the Event Unfolded

Nye County and the Town of Pahrump have experienced a large amount of population growth. Nye County's population topped 30,000 in 1998 and between 1990 and 2001, Nye County experienced an 89 percent growth rate. Similarly, the Pahrump Community Designated Place (CDP) has experienced a great deal of growth. In 1990, the population in Pahrump was 7,424, and in 2000, that population rose to more than 25,000 people, representing an increase of 336 percent. As of 2010, the population of Pahrump is approximately 37,796. Large parcels of land have been cleared of vegetation, subdivided and prepared for housing construction. Dirt and gravel roads were constructed, and many of the planned housing developments never materialized. In addition, abandoned and unirrigated farmland is common throughout the Pahrump Valley. Consequently, land use conflicts are common in Pahrump, primarily because zoning and zone code enforcement has been an incremental process as Nye County strives to catch up with the pace of population growth.

Citizen complaints of airborne dust in the late 90's led to the installation of a PM_{10} ambient air monitor[3] in 2003 in the downtown area. From January 2003 through November 2004, eight PM_{10} exceedances of the NAAQS 24-hour ambient air standard were recorded at the single monitoring station. Although these data were very useful in identifying air quality exceedances at one location in the Pahrump Valley, the use of only one ambient air monitor limited the capability of the monitoring network.

Given the localized nature of PM_{10} impacts, the need for more detailed data on particulate matter air quality in the Valley necessitated the use of several monitors throughout the Valley. Therefore, monitors at four locations now allow the Nevada Bureau of Air Quality Planning (BAQP) to further evaluate air quality on regional and local scales[4], as well as determine the effectiveness of specific and general mitigation efforts. These monitors help BAQP to determine those areas in the Pahrump Valley that are at the highest health risks due to chronic PM_{10} exposure.

During the years 2008 and 2009, the state of Nevada was experiencing drought conditions. Figures 2-3 and 2-4 were obtained from the National Weather Service, showing "departure from normal precipitation" conditions during these years as below normal. For the Pahrump Valley and surrounding area the maps indicate that the precipitation is approximately 2-4 inches below normal for two consecutive years, exacerbating the dry soil conditions. The absence of moisture/precipitation increases the amount of potential fugitive dust that may be

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[3] PM_{10} is airborne particulate matter that has an aerodynamic size less than or equal to 10 microns. By comparison, a human hair is about 70 microns in diameter.
[4] Neighborhood scale denotes that the data derived from this monitor are used to determine local air quality. By contrast, the remaining monitors are designed to assess PM_{10} transport into the Pahrump Valley or assess natural background air quality in the Pahrump Valley.

generated from native desert, which surrounds Pahrump. Winds frequently pick up dust from the disturbed vacant land and from the large number of dirt and gravel roads. The airborne dust can become a health hazard at high concentrations, and this occurs particularly during high wind events. In addition, the dust contributes to local visibility impairments and regional haze.

The typical seasonal and diurnal variation of PM_{10} concentration in the Pahrump Valley displays a distinct pattern. Most of the major wind events (winds greater than 20-25 mph) occur in the spring and fall. PM_{10} concentrations approaching or exceeding the NAAQS generally occur during these high wind events. Wind events in excess of 20-25 mph generate periods of gusting wind, creating blowing sand and dust. Fugitive dust[5] during such high wind events is largely responsible for exceedances of the 24-hour PM_{10} air quality standard. The main dust sources include a dry lake bed, entrained paved road dust, entrained dust from unpaved roads, construction activities, and disturbed vacant land. Given the dry desert climate and sparse vegetation, low levels of natural background emissions of fugitive dust have always been present in the Pahrump Valley, with higher levels occurring during fire and wind events.

Based on topography, population growth, land development, and weather, several exceedances occurred in 2009 and wind appears to be the major cause of the exceedances. On March 29th, 2009, a strong wind event developed causing very high North/Northwest winds throughout the Pahrump Valley. The average hourly wind speed at the Pahrump Meteorological Station during the exceedance was 26 mph. During this period, the peak sustained[6] hourly wind speed was 30 mph with an average maximum wind gust of 43 mph. The winds at the Pahrump Meteorological Station appear to have been strong enough to entrain sufficient dust to cause the monitored PM_{10} concentrations to increase.

On April 3rd, 2009 a strong wind event developed causing very high North/Northwest winds throughout the Pahrump Valley. The average hourly wind speed at the Pahrump Meteorological Station during the exceedance was 22 mph. During this period, the peak sustained hourly wind speed was 25 mph with an average maximum wind gust of 37 mph. The winds at the Pahrump Meteorological Station appear to have been strong enough to entrain sufficient dust to cause the monitored PM_{10} concentrations to increase.

Due to the widespread high winds, sources of the windblown dust were primarily natural areas, particularly from the surrounding desert. The timing of this event was verified with the high wind observations, blowing sand and dust, in conjunction with the hourly BAM PM_{10} measurement data from the nearby monitors. With the weight of evidence provided, the NDEP concludes that the

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[5] Fugitive dust is particulate matter suspended in the air either by mechanical disturbance of surface material or by wind action blowing across surface areas.

[6] For the NDEP Pahrump Valley met tower, peak sustained winds are based on 1-hour averages. Maximum wind gusts are based on highest value collected in each hour.

PM_{10} exceedances would not have occurred without the high winds and wind-entrained dust from sources that were not reasonably controllable or preventable.

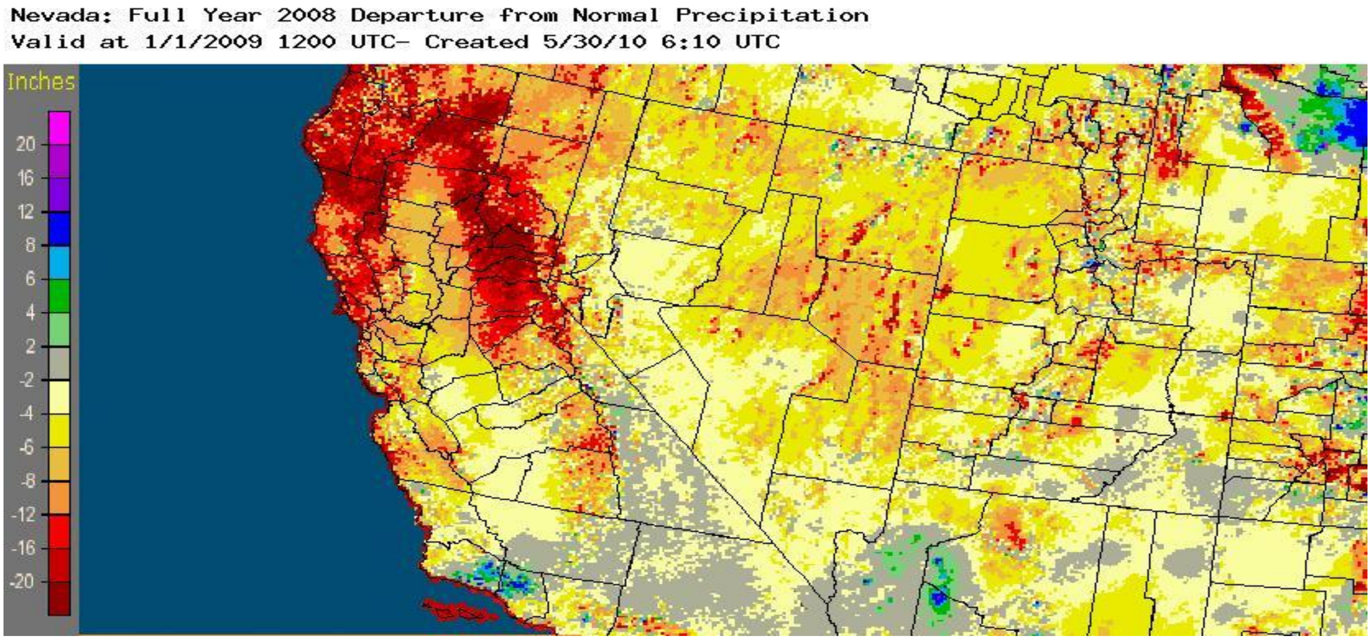

Figure 2-3
Full Year 2008 Departure from Normal Precipitation

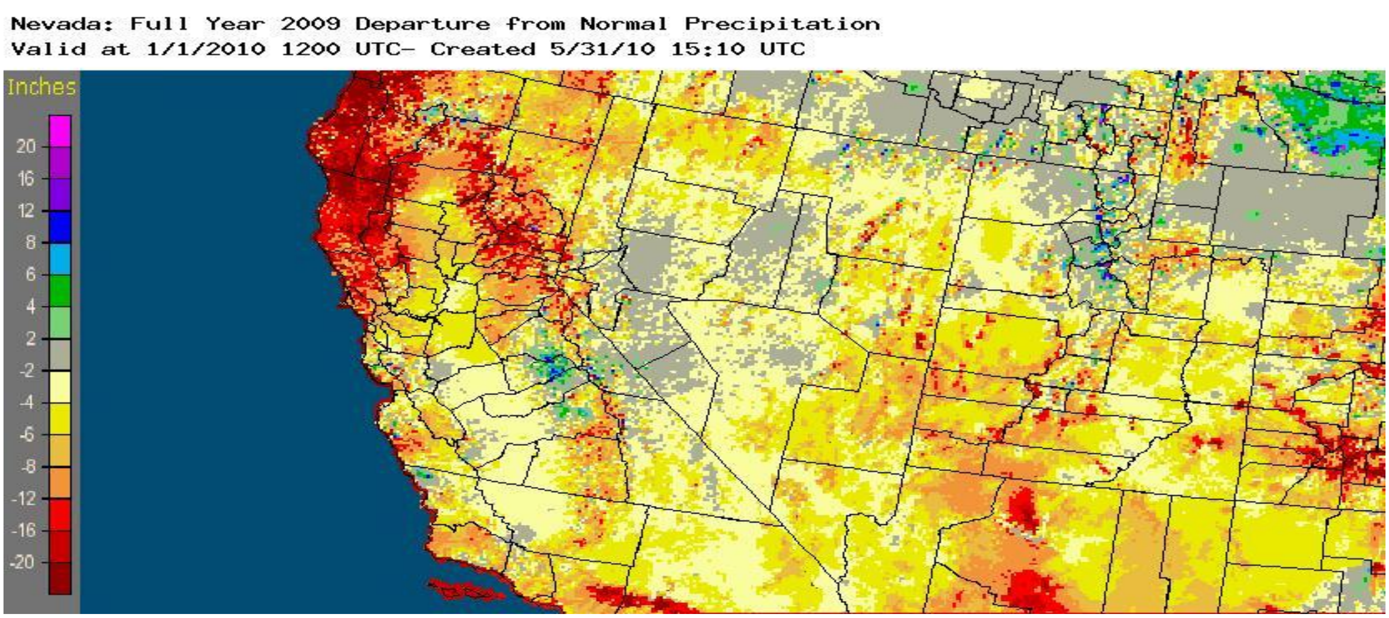

Figure 2-4
Full Year 2009 Departure from Normal Precipitation

2.3 Technical Criteria for a High Wind Dust Exceptional Event Demonstration

<u>Exceptional Event Criteria Summary</u>

The technical criteria outlined in the Exceptional Event Rule for these high wind and windblown dust exceptional event demonstrations are addressed in the order set forth in Table 2-3. The following sections describe how the technical criteria are met for the March 29th and April 3rd natural events.

TABLE 2-3
Technical Criteria for High Wind PM_{10} Exceptional Event Demonstration

Technical Criteria	Document Section
Not reasonably controllable or preventable	2.3.1
Clear causal relationship between the measurement and the event	2.3.2
Evidence that the event is associated with a concentration in excess of normal historical fluctuations, including background	2.3.2.1
Affects air quality	2.3.3
Caused by human activity unlikely to recur at a particular location OR a natural event	2.3.4
No exceedance or violation but for the event	2.3.5

2.3.1 Is Not Reasonably Controllable or Preventable

This demonstration identifies the sources that were expected to have contributed to the event and indicates how they were not reasonably controllable or preventable.

2.3.1.1 Source areas and categories expected to have contributed to the exceedance.

The area surrounding the air monitors is bounded to the east and north by the Spring Mountains and to the northwest by the Last Chance Range. Sources of windblown dust are from natural sources, particularly from the desert and anthropogenic sources. The primary sources with the potential to contribute PM_{10} in this area include undeveloped public and privately held lands. Other potential sources are construction activities, roadways, and some agricultural operations. These and all sources are subject to County and State regulatory controls.

2.3.1.2 Analysis of wind speed

The peak sustained wind speed equaled or exceeded 25 mph during the events of March 29th and April 3rd, concurrent with the highest hourly PM_{10} concentrations (Table 2-4). On March 29th, the event occurred from 1700-2300, with PM_{10} concentrations peaking from 1700-2200. On April 3rd, the event occurred from 0900-1800, with PM_{10} concentrations peaking at 1100. Also, the highest sustained wind speeds at two other NDEP Pahrump Valley stations during the March 29th and April 3rd exceedances were 26 and 24 mph, respectively (Table 2-5). Wind speeds in excess of 25 mph are commonly used as a threshold for when undisturbed natural lands will allow wind entrainment of PM_{10} dust or when Best Available Control Methods (BACM) on anthropogenic PM_{10} sources are likely to be overwhelmed. This threshold is appropriate for the purpose of this analysis.

2.3.1.3 Recurrence frequency

The peak sustained wind speeds in the Pahrump Valley do not occur very often, however, wind events above the 25 mph threshold tend to be associated with high PM_{10} concentrations. In the 2004-2010 period, exceedances of the PM_{10} NAAQS occur approximately 3.4 times per year. That there are not more exceedances of the federal PM_{10} standard shows that other factors play a role and that the BACM controls on windblown dust in the Pahrump Valley are effective on all but very windy days. All of the PM_{10} 24-hour NAAQS exceedances in the Pahrump Valley since 2004 have been attributed to high-wind natural events, which may recur and still be considered for exclusion under the exceptional event rule.

2.3.1.4 Controls analysis

This requirement is met by demonstrating that despite having reasonable and appropriate measures in place, the March 29th and April 3rd wind events caused the NAAQS exceedance. During these events, there were no other unusual PM_{10}-producing activities occurring in the Pahrump Valley and anthropogenic emissions were approximately constant before, during and after the event. Reasonable and appropriate measures were in place, as has been described in Section 1.4, Regulatory Measures.

Wind speeds were high enough to entrain dust from natural areas including undisturbed desert areas upwind of the monitor. Natural particulate source areas contributed heavily to the measured PM_{10} at Manse School on March 29th and April 3rd, from the upwind desert areas and especially through the undeveloped terrain of the surrounding mountains. Dust from these sources was not reasonably controllable or preventable during this event, due to the cost of applying controls over such a large land area and potential detrimental effects that controls could have on the natural ecosystems. PM_{10} was emitted from some BACM-controlled sources (mainly agricultural activities) as BACM controls were locally overwhelmed by the high winds. BACM measures can be overwhelmed when sustained wind speeds reach 25 mph.

Review of the complaint records and inspection reports for the Pahrump area indicated no evidence of unusual particulate emissions on March 29th or April 3rd other than related to the strong winds. No Notices of Violation were issued in the Pahrump Valley for fugitive dust on these days. The control methods were generally effective throughout the Valley, but were apparently overwhelmed in several instances by the strong, gusty winds, causing windblown dust and sand to be entrained in the atmosphere.

TABLE 2-4

Manse School - 2009 Exceedances of the PM_{10} Standard (150 ug/m3)

2009 Date	*Exceedance Interval (hours - PST)*	*PM10 Concentration 24-hr avg. (ug/m3)*	*Avg Hourly Wind Speed (mph) during exceedance interval*	*Wind Direction (degrees) during exceedance interval*	*Peak Sustained Wind Speed (mph) during exceedance interval*	*Time of Peak Sustained Wind (PST)*	*Average of Max Wind Gusts (mph) during exceedance interval*	*Maximum Wind Gust (mph)*	*Time of Max Gust (PST)*
29-Mar	1700-2300	**283 ug/m3**	**26**	**NW (315-350)**	**30**	**2000, 2100**	**43**	**53**	**2200**
3-Apr	0900-1800	**189 ug/m3**	**22**	**NW (314-339)**	**25**	**1100**	**37**	**40**	**1300**

2.3.2 Causal Connection

This demonstration shows a clear causal connection between the PM_{10} measured at the Manse School air monitoring station and the high wind event. In this case there is a clear causal connection between the onset of the strong, gusty winds upwind of the Manse School station in the evening of March 29th, 2009 and the morning and evening of April 3rd, 2009. The times coincide with the increases in the hourly PM_{10} concentrations at Manse School.

2.3.2.1 Historical fluctuations

While high wind natural events may recur, sometimes frequently, and qualify for exclusion under the exceptional events rule, information on the historical fluctuations of the particulate concentrations and the winds can give insight as to the frequency of events that may be expected in a given area. This also helps to demonstrate that the event affected air quality. Figure 2-5 shows time series of the available BAM 24-hour PM_{10} concentrations at the Manse School for the 4-year period of 2006 through 2009. During this period, fifteen days exceeded the federal standard of 150 $\mu g/m^3$. However, for the annual 2006 through 2009 Manse School dataset, these exceedances represent the 99.8th percentile. These concentrations are clearly in excess of normal historical fluctuations and the federal standard exceedances do not recur frequently. Since 2000, no 24-hour PM_{10} NAAQS exceedances occurred in the Pahrump Valley that were not associated with strong winds.

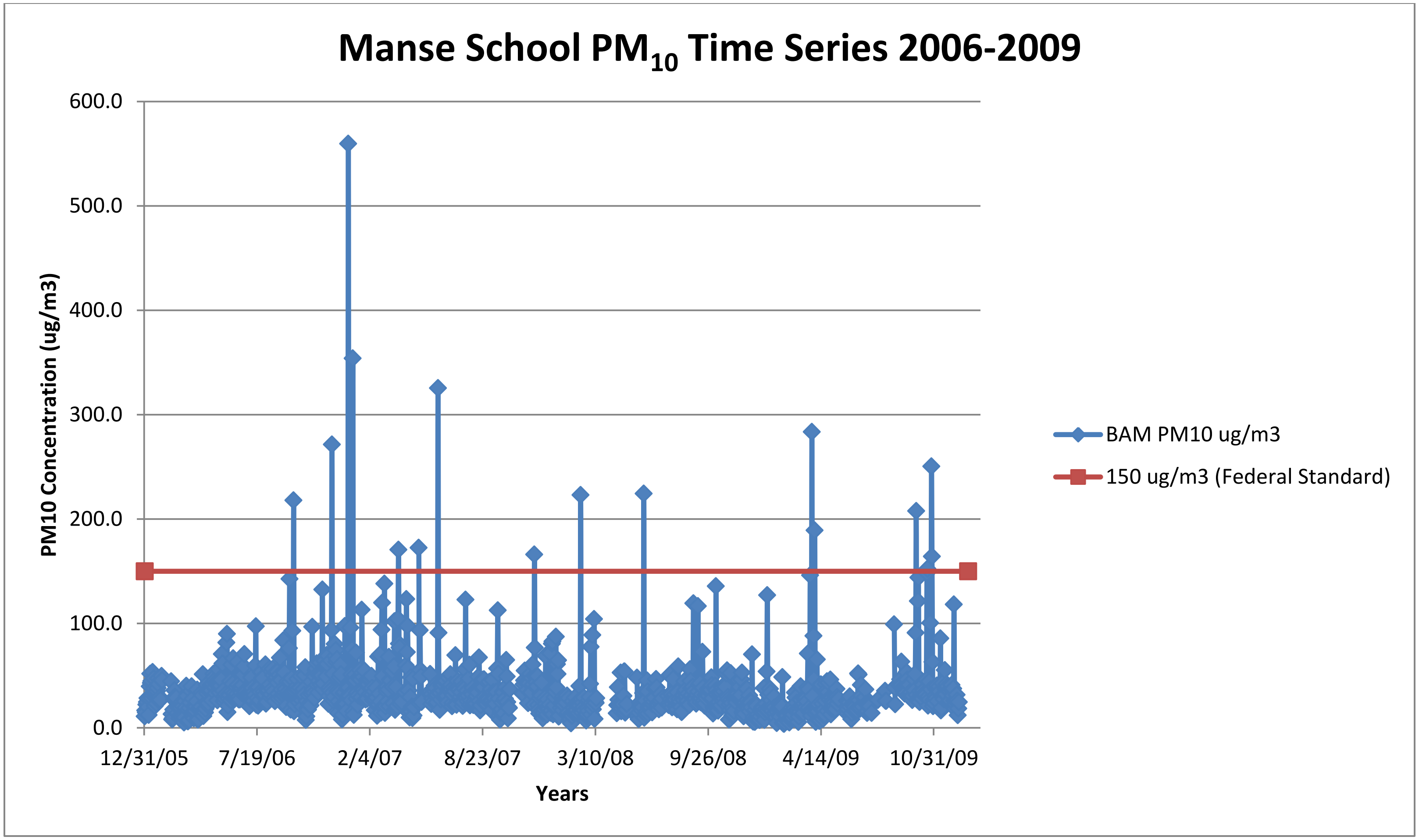

FIGURE 2-5
Time Series of Manse School 24-hour Averaged BAM PM_{10} ($\mu g/m^3$), 2006-2009

Climatological summaries of high winds from the official Pahrump Met Tower and local stations are presented in Table 2-5. These illustrate that the wind speeds observed during these events occur relatively infrequently. For example, sustained winds exceeding 40 mph at the Pahrump Met Station have never occurred, while winds exceeding 30 mph only occur in 0.3% of the measurements, on average, over the 5 years of data analyzed. While strong winds do recur in this area, the strong winds observed on the exceedance days, are in excess of the normal historical fluctuations.

TABLE 2-5
Annual Sustained Wind Speeds Reaching Thresholds of 30 and 40 mph at Three Stations Influenced by Pahrump Valley Winds
(*Based on Audited Pahrump Valley Met Station and Non-audited Local Met Parameters)*

Station Location	Date	Peak Sustained Wind Speed(mph)	Percentage of Days with Sustained Wind Speed	
			≥30 mph	**≥40 mph**
Pahrump Met Tower	03/29	30	0.3%	0%
	04/03	25		
Church Local Met	03/29	26	1.97%	0.4%
	04/03	24		
Linda Local Met	03/29	26	4.64%	2.18%
	04/03	24		

2.3.2.2 Event occurrence and geographic extent

This section contains details of the high-wind natural event occurrence on March 29th and April 3rd, including a description of meteorological conditions that led to the high wind events.

<u>Meteorological Setting</u>

Surface meteorology in the Pahrump Valley is generally characterized by regional prevailing winds from the southwest with monthly average wind speeds ranging from 4 to 9 miles per hour. As shown in Table 2-6, the "normal" average monthly three year average wind speed for the reporting period is approximately seven to eight miles per hour. In addition to prevailing winds, some wind generated by local topography and temperature also affects the Valley. During the day, as the air mass is heated, wind directions are generally upslope and in an easterly direction. At night the wind direction is reversed and cool air drawn from the higher elevations (i.e. Spring Mountains) drains

Table 2-6

Supplemental Information Data

		During Exceedance Interval						Normal Conditions			
		Monitor Site		MET Site				Monitor Site	MET Site		
2009 Date	Location	Daily PM_{10} (µg/m^3) Avg	Number of Hours	Wind Direction (blowing from)	Avg Hourly Wind Speed	Avg Maximum Wind Gust		PM_{10} Avg (µg/m^3) over 12 months 2009	Monthly Wind Direction (blowing from) 2009	3-Yr Avg Wind Speed 2006-2008	Monthly Maximum Wind Gust 2009
29-Mar	Manse	283	7	NW	26 mph	43 mph		32	SW/S/SE	8 mph	53 mph
3-Apr	Manse	189	10	NW	22 mph	37 mph		32	N/NW	7 mph	44 mph

to the lower Valley. The winds driven by local topography are not as strong as those associated with weather fronts in the spring and fall.

National Weather Service advisories and warnings for high winds were issued for all of the exceedance days. A Wind Advisory is issued by the NWS when sustained winds of 25 to 39 mph are expected and/or gusts to 57 mph. A High Wind Warning is issued when sustained winds of 40 mph or more are expected for 1 hour or longer, or for wind gusts of 58 mph or more with no time limit. Appendix E shows an example of a high wind advisory for the Pahrump Valley.

2.3.2.3 Temporal relationship between the high winds and elevated PM concentrations

Figures 2-6 and 2-7 show the hourly BAM data from the Manse School air monitoring station, along with the wind speeds from the Pahrump Valley met station. They clearly show that the peak hourly PM_{10} concentrations occurred in the morning and afternoon associated with the peak wind speeds and gusts. They establish the temporal relationship between the high winds and the elevated PM_{10} concentrations at the Manse School monitor.

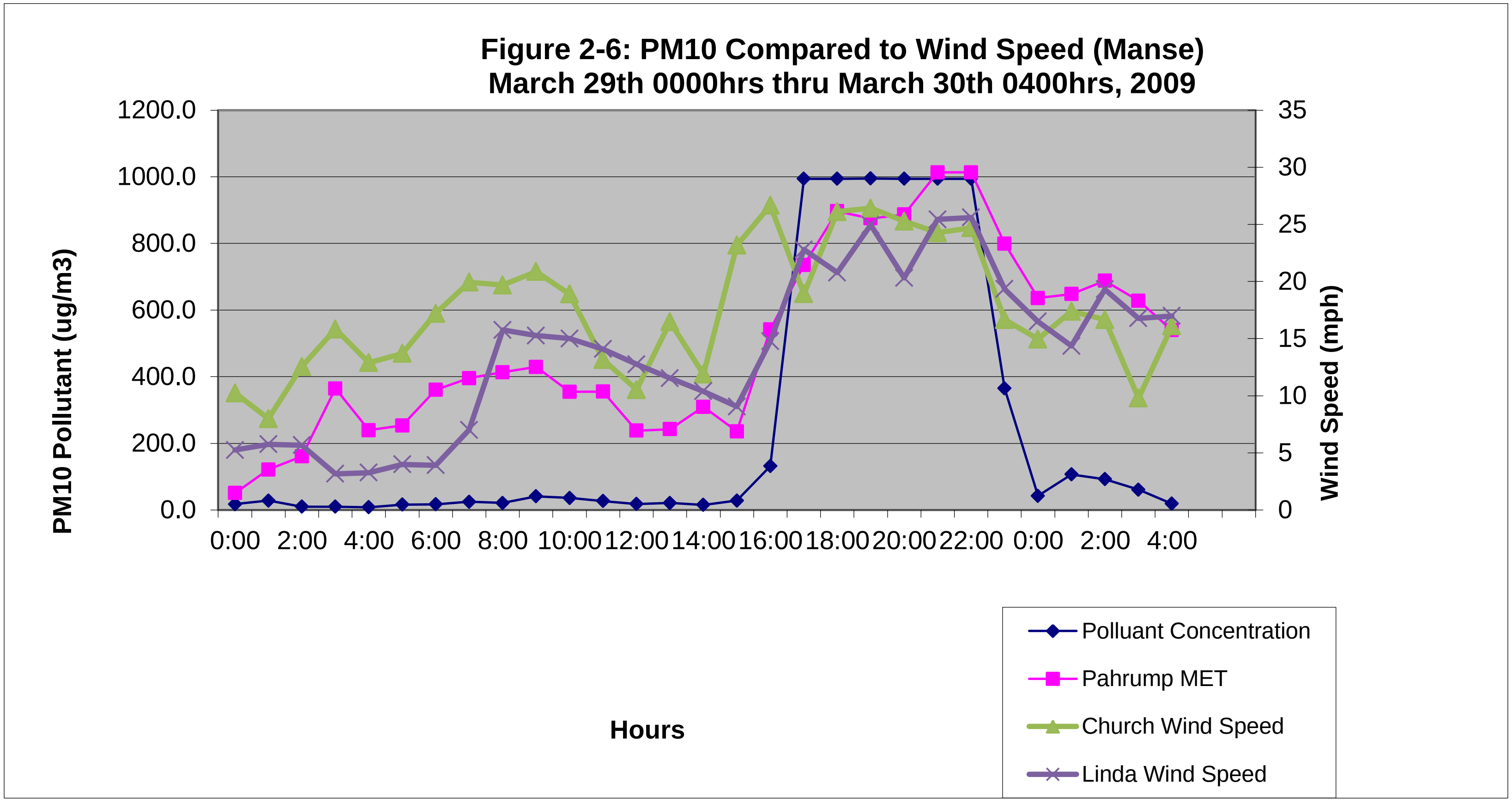

Figure 2-6: PM10 Compared to Wind Speed (Manse)
March 29th 0000hrs thru March 30th 0400hrs, 2009
PM10 Pollutant (ug/m3)
1200.0
1000.0
800.0
600.0
400.0
200.0
0.0
Wind Speed (mph)
35
30
25
20
15
10
5
0
0:00 2:00 4:00 6:00 8:00 10:00 12:00 14:00 16:00 18:00 20:00 22:00 0:00 2:00 4:00
Hours
Polluant Concentration
Pahrump MET
Church Wind Speed
Linda Wind Speed

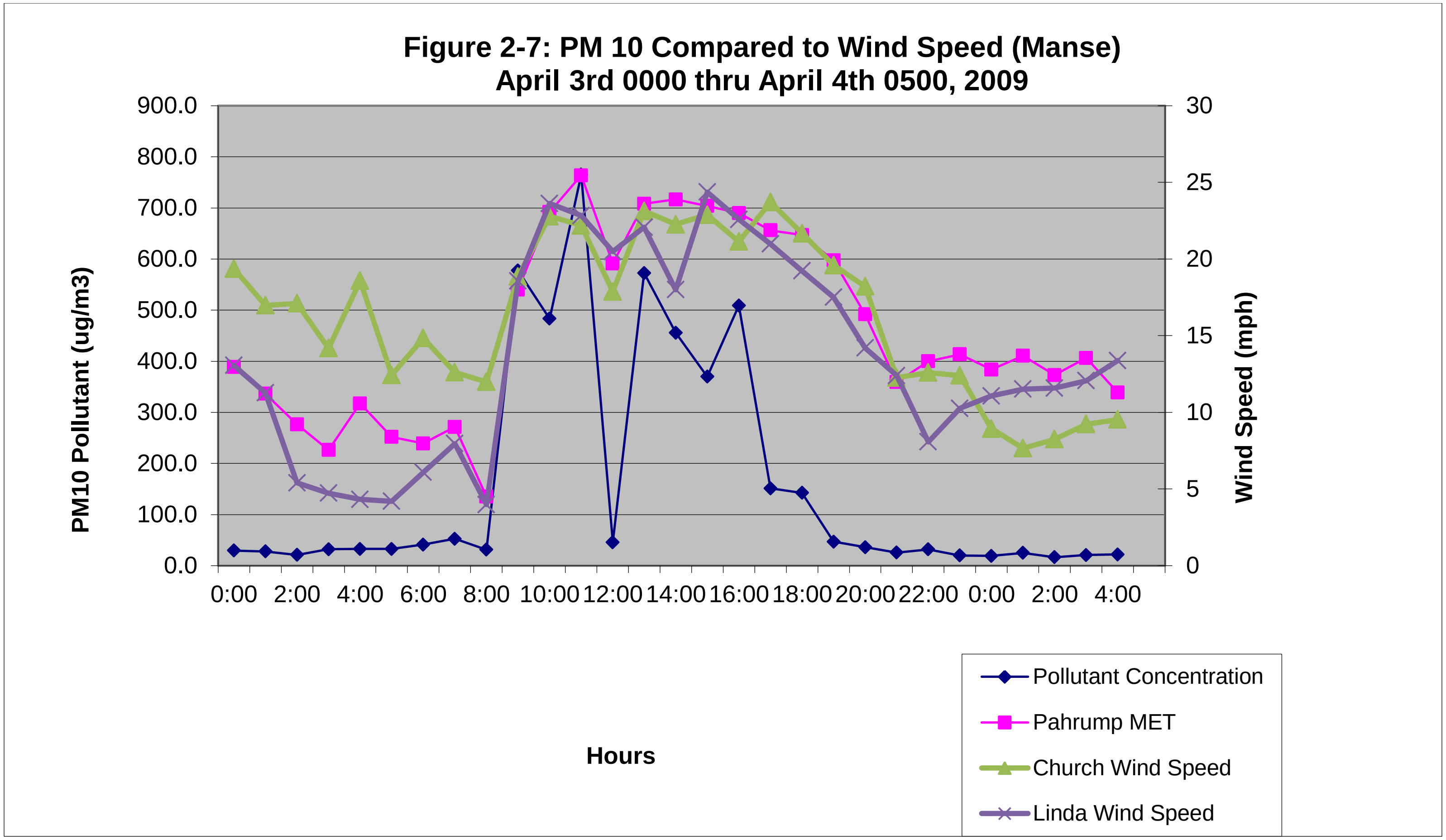

Figure 2-7: PM 10 Compared to Wind Speed (Manse)
April 3rd 0000 thru April 4th 0500, 2009
PM10 Pollutant (ug/m3)
Wind Speed (mph)
Hours
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
30
25
20
15
10
5
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
2:00
4:00
Pollutant Concentration
Pahrump MET
Church Wind Speed
Linda Wind Speed

2.3.2.4 Comparison of event-affected day(s) to specific non-event days

Table 2-7 shows the daily 24-hour averaged PM_{10} concentrations from daily FEM (BAM) measurements within the Pahrump Valley and Las Vegas from March 29th and April 3rd. Figure 2-8 shows the time series of the FEM BAM daily 24-hour average PM_{10} concentrations for the Pahrump Valley and the Las Vegas Valley for the same period, illustrating the concentration peaks at all locations. The only PM_{10} concentration in excess of the federal standard measured during this period occurred at the Manse School. However, several other areas of the Pahrump Valley had elevated PM_{10} concentrations on these days, indicating that this area is prone to high winds. The FEM PM_{10} concentrations at the Manse School on the exceedance days were nearly 5 times that measured on the sampling days before and after the event. This indicates the impact of the natural event on PM_{10} air quality, resulting in higher than typical PM_{10} concentrations above the federal standard level at Manse.

TABLE 2-7
24-Hour BAM FEM PM_{10} Measurements (ug/m3) for Pahrump and Clark County Stations Before and After March 29 and April 3, 2009.

Station	3/23	3/24	3/25	3/26	3/27	3/28	**3/29**	3/30	3/31	4/1	4/2	**4/3**	4/4	4/5	4/6	4/7	4/8
Pahrump Stations:																	
Manse School	36.7	19.0	15.3	146.2	15.9	11.5	**283.4**	30.4	15.7	88.1	46.6	**189.0**	14.1	5.5	16.1	65.5	17.9
Catholic Church	6.4	3.7	5.8	42.6	3.4	4.1	82.2	7.2	5.9	11.3	16.2	32.6	8.1	3.3	6.1	19.1	4.1
Linda Street	24.3	20.1	27.0	33.4	21.2	22.0	74.2	26.3	25.4	27.1	35.1	49.2	23.2	23.0	23.2	46.2	21.8
Clark Co. Las Vegas Stations:																	
New Forest Drive	19.8	10.4	14.9	30.7	10.0	12.4	84.7	17.9	14.7	22.3	49.9	24.8	9.9	9.0	11.3	19.7	10.5
North Valdez St	9.0	9.8	15.6	23.9	9.5	14.9	69.1	13.1	14.9	17.0	26.0	28.5	9.2	7.7	10.9	18.6	11.3
Pavilion Center Dr	- - -	5.7	11.5	13.4	6.0	11.3	57.2	9.5	14.5	12.6	24.2	19.1	7.3	5.3	9.1	20.4	7.8
West Azure Ave	8.8	10.7	17.8	30.3	- - -	- - -	- - -	- - -	- - -	26.3	31.0	37.4	11.2	12.5	- - -	29.7	16.8
Sunrise Ave	14.0	11.3	21.0	33.5	15.5	28.2	81.8	15.0	25.7	30.5	73.0	49.3	13.0	13.5	17.9	35.2	13.2
Katie Ave	12.1	11.2	21.8	29.7	13.5	23.8	75.1	17.0	31.6	23.9	85.9	32.1	12.0	15.3	15.4	31.8	11.9
East Tonopah	18.5	16.8	21.7	29.9	14.3	25.8	68.7	19.1	31.5	36.0	61.8	43.0	13.4	17.0	17.7	42.2	14.8
Other Clark Co. Stations:																	
North Las Vegas - Mitchell St	12.7	12.0	25.5	26.8	11.3	21.2	64.1	14.5	20.8	29.5	58.5	50.8	9.9	7.8	15.4	31.4	18.8
N Las Vegas - Hwy 93/115 Intersection	6.6	7.3	18.9	19.6	16.3	38.8	58.1	9.8	15.0	14.2	53.2	24.6	6.5	5.3	6.8	32.0	25.2
Mesquite	6.3	27.7	16.7	16.8	13.4	16.8	48.3	11.7	18.3	23.0	35.0	25.3	8.5	8.6	12.1	16.0	21.0
Henderson	14.3	10.8	17.8	21.0	8.8	19.3	66.4	12.1	16.1	20.6	43.4	24.8	9.2	8.8	10.9	20.2	13.4
Boulder City	13.3	7.0	12.3	21.4	7.7	16.8	55.0	10.5	10.8	16.6	28.5	28.7	7.7	4.3	6.6	19.5	28.3
Jean	9.0	5.3	11.5	20.3	5.9	7.3	61.4	10.0	7.2	16.1	24.1	31.5	10.6	5.3	7.0	17.3	15.8

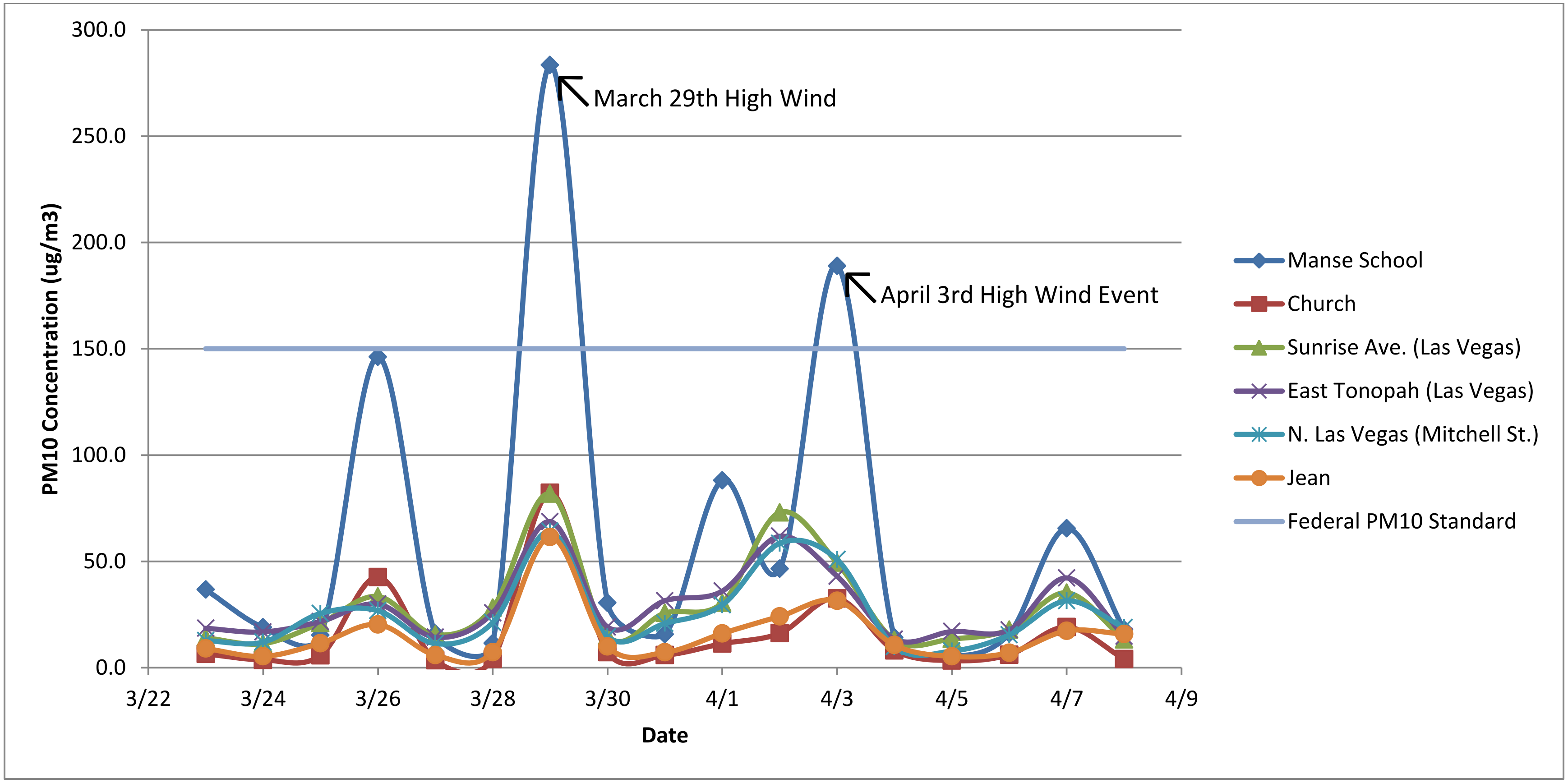

FIGURE 2-8
BAM Daily 24-Hour PM_{10} Concentrations (µg/m3) Measured in the Pahrump Valley and Las Vegas Valley between March 22nd and April 8th, 2009

2.3.3 Affects Air Quality

This criteria is supported by historical concentration data and demonstrated as part of the clear causal relationship. The NDEP has provided evidence for the clear causal relationship which serves also to demonstrate that the event affected air quality.

2.3.4 Was a Natural Event

A high wind dust event can be considered a natural event, even when a portion of the wind-driven emissions are anthropogenic, as long as those emissions have a clear causal relationship to the event and were determined to be not reasonably controllable or preventable. This demonstration has shown that the event was not reasonably controllable or preventable, in spite of the various control programs. It has also established a clear causal relationship between the exceedance and the high wind event timeline and geographic location. This event can be treated as a natural event under the exceptional event rule.

2.3.5 The "But For" Test

To qualify as an exceptional event, it is necessary to demonstrate that there would have been no exceedance "but for" the event. To meet this "but for" requirement, it must first be shown that no unusual anthropogenic activities occurred in the affected area that could have resulted in the exceedances, besides the high wind event. Activities that generate anthropogenic PM_{10} were approximately constant in the Pahrump Valley immediately preceding, during and after the events.

Based on the data provided in this report, the NDEP concludes that there would not have been exceedances of the PM_{10} NAAQS in the Pahrump Valley if high winds were not present. The causal connection of the measured PM_{10} and the strong winds in the Valley indicate that "but for" the high wind event the NAAQS exceedances would not have occurred.

2.3.6 Conclusion

There is a strong causal connection between the high PM_{10} measured in the Pahrump Valley on March 29th and April 3rd and the strong high wind event, supported by the meteorological conditions. Due to the widespread winds, sources of the windblown dust included both natural, undisturbed areas, and BACM-controlled anthropogenic sources. The timing of this event is verified with the high wind observations in conjunction with the hourly BAM PM_{10} measurements from the available monitors. These show a strong correlation between the high winds and high hourly PM_{10} concentrations. The NDEP therefore concludes that the PM_{10} exceedances would not have occurred without the high winds that re-entrained surface dust. Based on the evidence of a high wind natural event set forth in this report, NDEP requests that the

EPA support the exclusion of the PM_{10} exceedances at the Manse School monitoring station on March 29th and April 3rd, 2009.

3 PROCEDURAL REQUIREMENTS

3.1 Flagging of Data

The NDEP has submitted the PM_{10} data from the Manse School monitor to the U.S. EPA AQS database and has placed the appropriate flags on the data indicating that the data was affected by exceptional events due to high winds (Flag RJ, requesting exclusion due to high winds). To exclude the midnight to midnight 24-hour average, each hour of the Manse School BAM data was flagged individually. Since only one flag can be submitted for each station exceedance, this is the most appropriate for PM_{10} on this day. Such flagging ensures that the air quality data is properly represented in the overall air quality planning process.

3.2 Public Notification

The Nevada Division of Environmental Protection has prepared this documentation to demonstrate that these exceedances were due to high wind natural events, in accordance with the U.S. EPA Exceptional Event Rule. The documentation in support of this demonstration and request for the treatment of the data associated with these exceedances as exceptional events has been posted on the NDEP website http://ndep.nv.gov/admin/public.htm#air_qp requesting review and comment by the public for a minimum of 30 days. Public comments should be directed to:

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Nevada Division of Environmental Protection
901 S. Stewart Street
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Email: dwinkelman@ndep.nv.gov